

CO05-002-e

Restrictive ventilatory defect of neuromuscular or neurological origin. Support for patient therapeutic education (cough school)

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Keywords: Cough; Therapeutic education; Neurology; Neuromuscular diseases

Objectives.– To assess the importance of screening for cough deficiency in patients with a restrictive ventilatory defect of neuromuscular or neurological origin, seek an effective technical assistance, and train the patient and the primary caregivers to the technique used in case of dependency.

Method.– Analysis of case series as part of a preliminary study and from a standardized assessment protocol: Assessment of cough (including the human environment and equipment, spirometry with cough peak expiratory flow (cough PEF) and respiratory pressure measurements, assistance tests (testing manual and/or instrumental techniques selected as a function of the context, evaluation of their tolerance and their effectiveness with an assisted cough PEF), training if necessary of private practice physiotherapist and caregivers. Inclusion criteria: patients with a restrictive ventilatory defect of neuromuscular or neurological origin with a cough PEF less or equal to 270 L.min⁻¹ (ineffective cough threshold).

Results.– Thirty-three patients were evaluated, including 14 SCI and 6 neuromuscular diseases. The cough PEF was below 270 L.min⁻¹ in 14 cases. Thirteen received support tests and training. Since then, five patients have been using the technique taught during an episode of obstruction.

Discussion/conclusion.– This “cough school” concept is an essential evaluation and education support for patients and their families. It meets the specifications of therapeutic education programs in terms of developed skills: self-monitoring of respiratory status (signs of obstruction, hypercapnia), solicitation of primary caregivers, performing a technical gesture or supervision by caregivers, and prevention of avoidable complications. “The cough school” is part of specialized physical medicine and rehabilitation centres and requires close work with private practice therapists, who must be trained. Benefits analysis and satisfaction measurements will be the topic of a future study.

Further reading

Leger P, Paulus J. Modalités pratiques de la ventilation non invasive en pression positive, au long cours dans les maladies neuromusculaires. *Rev Mal Respir* 2006;23(suppl. 4):7–9.

Péron T, Plassat R. Les masseurs kinésithérapeutes libéraux bretons face aux déficiences de toux. *Kinesither Rev* 2010;106:51–8.

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CO05-003-e

Effect of cross-slope on cardiorespiratory stress in paraplegic manual wheelchair users

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Keywords: Paraplegics; Manual wheelchair; Displacements; Cross slope; Cardiorespiratory strains; Employment; Environment

Introduction.– Moving in a manual wheelchair (MWC) is one of the important factors determining the non-integration or withdrawal of MWC users of working age from occupational activities. Among the difficulties of moving,

cross-slope, defined as the inclination of the field perpendicular to the flow direction, is one of the most important. This constraint, which may be present on the way to work and/or at the workplace, is theoretically limited to 2% by law. The reality is quite different, causing poorly known cardiorespiratory stress.

Objective.– This study aims to quantify the cardiorespiratory stress encountered by paraplegics moving in MWC on a cross-slope.

Methods.– Twenty-five paraplegics performed a sub-maximal arm cranking test and eight tests on a track. They covered a distance of 300 m at four tilts (0, 2, 8 and 12%) and two speeds (comfort and imposed speed at 3.5 km/h).

Results.– At 3.5 km/h, the average cardiac cost during their last lap was increased 3-fold from 13 bpm at 0/2% and 28 bpm at 8% to 40 bpm at 12% cross-slope. The average oxygen consumption increased by 60% from 8 ml.kg⁻¹.min⁻¹ at 0/2% and 11 ml.kg⁻¹.min⁻¹ at 8% to 13 ml.kg⁻¹.min⁻¹ at 12%.

Discussion/Conclusion.– Cross-slope implies consequent cardiorespiratory stress and requires considerable effort which users are not always able to provide. The unsuitability of the environment amplifies the initial stress for MWC users and favours their exclusion from the work market.

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Cross slope-induced stress for paraplegic manual wheelchair users: An EMG analysis

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Keywords: Paraplegics; Manual wheelchair; Displacements; Cross slope; Muscles strains; Employment; Environment

Introduction.– Moving over a cross-slope is a factor of strain for manual wheelchair (MWC) users. In France, the cross-slope tilt is limited to 2% by law. However, this limit is frequently overcome and in these cases, the physiological consequences are poorly assessed.

Objective.– This study aimed to quantify, through electromyographic (EMG) recordings and analysis, the muscular strains while moving in a MWC over a cross-slope surface.

Methods.– Twenty-five male paraplegics achieved a 300-meter displacement in eight experimental conditions combining four different tilts: 0 (flat), 2 (French standard), 8 and 12%, and two speeds (comfort and imposed at 3.5 km/h). Sixteen muscles involved in the MWC propulsion were assessed using surface EMG quantified by their Root Mean Square values.

Results.– The first results showed a noticeable effect of cross-slope on the main muscles EMG for both intensity and right/left balance. At the highest tilts, objective signs of muscular fatigue were demonstrated by EMG changes.

Discussion/Conclusion.– The deleterious effects of cross-slope tilt on the MWC displacement strains are undeniable: muscle activity level required to oppose the cross-slope effect is high. If the slope is significant and/or if the path length on cross-slope is consistent, the occurrence of fatigue is high. Eventually, muscular stress may lead to the development of musculoskeletal disorders and pathologies.

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Rotator cuff tears in persons with spinal cord injury: Prospective study and relevance of a multidisciplinary approach

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